

Control Database Requirements

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The Control Database will be used in the monitoring and control of the DØ experiment in Run 2.

It should store the essential attributes of hardware devices and provide the Control DAQ (based on EPICS) with the information required to read from or write to a device. In particular it should contain information on detector systems, low and high voltage power supplies, cryogenics, argon purity monitoring and environmental conditioning.

In addition to monitoring and control during the runs, the database should support the Control DAQ in downloading the detector control system, prior to a run start, with appropriate device settings for selected run conditions.

The design of the Control Database should be aided by, but not bound to, the content scope of, and the experience with the Hardware Database of Run 1. It should also be determined which data, if any could be salvaged and extracted into the new Control Database.

The Control Database should serve the following needs:

1. generate extractions of EPICS device records

EPICS has its own database, which resides on a host (OPI), to be downloaded to front end processors (IOC's). There are 2 classes of EPICS database files, usually kept in a text format:

- ".dbd" file with definitions of record types
- ".db" file with record instances

A record contains a number of fields, the set of which depends upon the specific record type, such as Analog Input, Analog Output, Binary Input, Binary Output, etc.

A record type instance must have a unique name, say "device", across all IOCs attached to the same sub-net; its "device.field" entities resemble "device.attribute" entities of Run 1, except that Input (read) and Output (write) functions are disjointed in EPICS.

Records can be linked together to create control algorithms and sequences.

The Control Database should accommodate the data contained in EPICS record instances (".db" file) and their linkages, in an easily retrievable way. A utility should be written to extract them in a form needed by EPICS.

2. provide necessary information for the Alarm System

The design of the Alarm System should influence the implementation of alarms in the database.

Nominal device readings, their limits, alarm severity, action upon alarm, etc, should be adequately described in the database. Detailed information about a device, which has caused an alarm, should be easily retrievable upon the alarm id.

3. provide an information for a generic Parameter Page

4. mapping of several devices (ala EPICS records) into more complex objects

The constituents of an object which are the same for a number of object instances should be entered only once and then referenced by the instances.

Templates should be provided for easy generating the object instances.